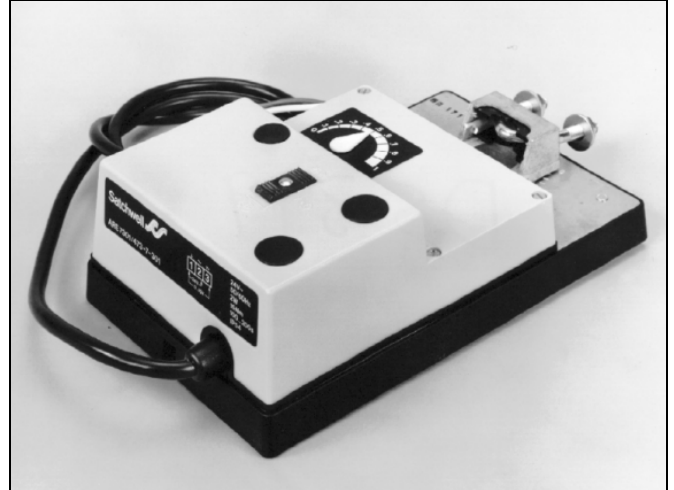


ROTARY ACTUATORS

Satchwell Rotary Actuators type 'AR (Mk 7)' are reversing actuators having a rotary output for direct coupling to air dampers or other devices requiring a rotary drive through approximately 95°. They are suitable for either two-position or modulating control dependent on the device providing the input signal. Models are available for 230Vac or 24Vac and provision is made for a 0-10Vdc input signal. A manual operating feature is built-in.

A special feature of the design is that mounting brackets, universal joints and linking rods are not required for normal damper applications, thus reducing installation and commissioning time.



FEATURES

- **Direct coupling to all normal dampers without mounting brackets linkage kits - saves site time.**
- **Self adjusting stroke - can be stalled against mechanical end stop.**
- **Manual operation or override facility built-in**
- **Comprehensive range of accessories for adding switches, potentiometers or special damper applications**

Notes:

Using Satchwell damper actuators

The actuators listed in this data sheet are intended for the operation of air dampers in HVAC systems.

Torque requirements

When calculating the torque required to operate dampers, it is essential to take into account all the data supplied by the damper manufacturer concerning cross sectional area, design, mounting and air flow conditions.



Multi-Lingual Instructions
MLI 3.220 - Installation Instructions



SPECIFICATIONS

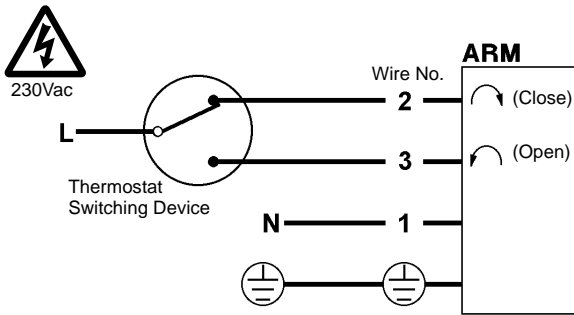
TYPE	ARM7601	ARX7201	ARE7301	ARE7303
Adjustable 'Start & Span' : Fixed 'Span' :	- -	- -	• -	- •
Action:	Open/Close actuators with single pole contact control		3-Point modulating actuator	
Nominal Voltage:	230Vac 50/60Hz	24Vac 50/60Hz, 24Vdc	24Vac 50/60Hz	24Vac 50/60Hz, 24Vdc
	Connect via a safety transformer - see DS 25.001			
Nominal Voltage Range:	198...264Vac	19.2...28.8Vac, 21.6...26.4Vdc	19.2...28.8Vac,	19.2...28.8Vac, 21.6...28.8Vdc
For Wire Sizing:	13VA @ 50Hz, 14VA @ 60Hz	4VA	5VA	5VA
POWER CONSUMPTION - Motoring: - Holding:	13W @ 50Hz, 14W @ 60Hz	1.8W -	3W -	3W -
Connecting Cable:	0.9m long, 4 x 0.75mm ²	0.9m long, 3 x 0.75mm ²	0.9m long, 3 x 0.75mm ²	0.9m long, 5 x 0.75mm ²
Control Signal Y ₁ :	-	-	0-10Vdc @ 100kΩ input resistance(0.1mA).	0-10Vdc @ 100kΩ input resistance (0.1mA).
Control Signal Y ₂ :				0-20V phasecut @ 8kΩ input resistance (50mW)
Operating Range:	-	-	-	2-10Vdc (at control signal Y ₁) 2-10V phasecut (at control signal Y ₂)
Measuring Voltage U:	-	-	-	2-10Vdc @ max. 0.5mA (for 0...100% angle of rotation)
Starting Point U ₀ : Span ΔU: Factory Setting	-	-	adjustable 2.0-8.4Vdc (scale 0...80%) adjustable 1.6-8.0Vdc (scale 20...100%) U ₀ =2Vdc, ΔU=8Vdc	-
Sync Tolerance:	-	-	±5%	
Direction Of Rotation:	Reversible with switch A/B		Reversible with switch A/B at switch position A ↻ resp. B ↻ (at Y=0V)	
TORQUE (at rated voltage):	min 15Nm @ 50Hz, min 10Nm @ 60Hz	Min. 15Nm		
Angle Of Rotation:	Mechanically limited to 95°			
Running Time:	≈80s	90...150s (0...15Nm)	≈100...200s (0...15Nm)	
Sound Power Level:	Max. 45dB (A),			
Position Indication:	0...10 (0=stop ↻) and reversible indicator			
End of Stroke Limits:	By stalling against mechanical stops.			
Protection Class	I (with PE conductor)	III (safety extra-low voltage)		
Degree Of Protection:	IP 54 (bottom cable entry only, otherwise IP 42)			
Mounting Attitude:	Any position			
Ambient Temp Limits: Non Operating Temp:	-30...+50°C -40...+80°C			
Humidity:	5 to 95% RH Non-Condensing			
EMC	CE according to 89/336/EEC, 92/31/EEC and 93/68/EEC			
Low Voltage Directive:	CE according to 73/23/EEC	-		
Maintenance:	Maintenance-free			
Weight:	1600g	1400g	1400g	1460g
Application:	Two-position control from a thermostat, time switch or other switching device having a 220/240V rated change-over contact.	Two-position control from a thermostat, time switch or other switching device having a 24V rated change-over contact. Modulating control from a controller having a suitable output.	Modulating control from any controller providing a 0-10Vdc positioning signal e.g. KMC, CZT, DDTE, DRTE, DWTE, MMC, BAS, IAC, MN.	

ACCESSORIES

Auxiliary Switch Kits:	831-7-216 : 1 SPDT 10A (3A) 250V with 3 core cable, 0.9m long 831-7-208 : 2 SPDT 10A (3A) 250V with 6 core cable, 0.9m long
Auxiliary Potentiometer Kit:	831-7-209 : 140Ω with 3 core cable, 0.9m long
Stroke Limiting Device:	862-7-702 used to limit angle of rotation below 90°, in steps of 10°.
Traditional Damper Linkage:	826-7-902 for rod operation, including crank arm, ball joints etc.

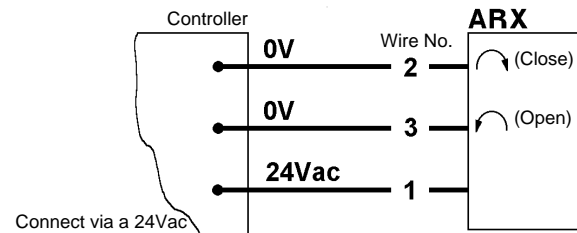
CONNECTION DIAGRAMS

BASIC DIAGRAM FOR ARM



Use an isolator with a minimum contact gap of 3mm (conforming to EN 60335-1) to isolate the ARM from the mains supply. Fig.1

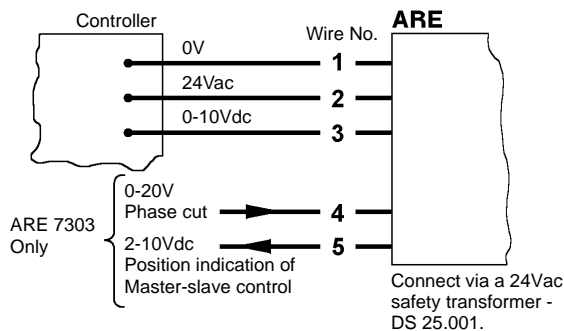
BASIC DIAGRAM FOR ARX



Connect via a 24Vac safety transformer - DS 25.001.

To achieve transfer switching (i.e. 1T or 2T) an auxiliary switch pack is required. Fig.2

BASIC DIAGRAM FOR ARE

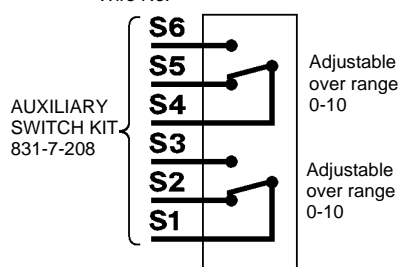


Several AREs may be connected in parallel to the same 0-10V input signal, assuming an adequate 24V supply is available. Fig.3

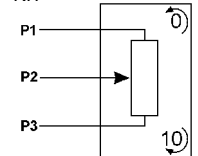


Use an isolator with a minimum contact gap of 3mm (conforming to EN 60335-1) to isolate the ARM from the mains supply.

Wire No.



AUXILIARY POTENTIOMETER KIT



831-7-209

AUXILIARY SWITCH KIT 831-7-216

WARNING - AUXILIARY SWITCHES MAY BE AT MAINS POTENTIAL

Fig.4

WIRING PRECAUTIONS

Actuator Type	Wiring from actuator to Controller ^a :	Max. length of 1.5mm ² cable unshielded	Max. resistance per conductor
ARX ARM	Supply	100m	5Ω
	Feedback wiring from controller to auxiliary potentiometer, where fitted	100m	15Ω
ARE	24V supply	100m	3Ω
	0-10Vdc signal	100m	50Ω

^a When wiring to BAS outstations refer to the appropriate outstation Data Sheet for Wiring Precautions.

WARNINGS -

IF AUXILIARY SWITCHES ARE FITTED AND USED AT MAINS POTENTIAL, OBSERVE LOCAL WIRING REGULATIONS, EARTHING REQUIREMENTS AND ALL USUAL SAFETY PRECAUTIONS.

ARM ACTUATORS ARE AT MAINS POTENTIAL. OBSERVE LOCAL WIRING REGULATIONS, EARTHING REQUIREMENTS AND ALL USUAL SAFETY PRECAUTIONS.

For longer lengths of 24V supply wiring, increase cable size and observe maximum resistance.

Where screening is required, use either screened cable or MICC.

Use an isolator with a minimum contact gap of 3mm (conforming to EN 60335-1) to isolate the ARM from the mains supply.

ARX and ARE must be connected to 24Vac via a safety transformer conforming to EN 61558.

To achieve transfer switching (i.e. 1T or 2T) an auxiliary switch pack is required.

OPERATION

The actuator is fitted directly to the damper and the clamp tightened securely to the damper shaft. A universal mounting bracket, supplied with each actuator, must be fitted to prevent rotation of the actuator during operation.

The angular stroke of the actuator is mechanically limited to 90°; it will stall against end stops and is protected against overloading.

Manual operation can be achieved by depressing the spring-loaded button on the actuator cover, which disengages the gear train and allows the damper blades to be adjusted by hand. The position of the actuator is indicated on a scale marked 0-10.

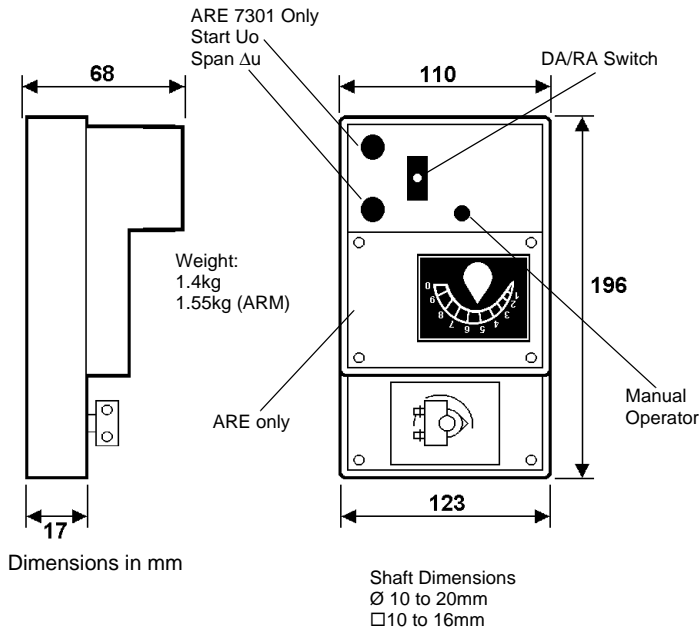
MAINTENANCE

WARNING -

STEAM OR HOT WATER HAZARD. BEFORE REMOVING ACTUATOR FROM VALVE OR OPENING VALVE, ENSURE THAT THE VALVE CONTROL MEDIUM IS ISOLATED AND RELIEVE THE PRESSURE. WORK SHOULD ONLY BE CARRIED OUT BY A COMPETENT ENGINEER.

A periodic check of the control system is recommended.

DIMENSION DRAWING



WARNINGS -

STEAM OR HOT WATER HAZARD. BEFORE REMOVING ACTUATOR FROM VALVE OR OPENING VALVE, ENSURE THAT THE VALVE CONTROL MEDIUM IS ISOLATED AND RELIEVE THE PRESSURE. WORK SHOULD ONLY BE CARRIED OUT BY A COMPETENT ENGINEER.

CERTAIN MODELS (AND AUXILIARY SWITCHES WHERE FITTED) ARE AT MAINS POTENTIAL. LOCAL WIRING REGULATION AND USUAL SAFETY PRECAUTIONS MUST BE OBSERVED. NOTE EARTHING REQUIREMENTS.

THESE ACTUATORS ARE NOT SAFETY DEVICES AND SHOULD NOT BE USED ON FIRE DAMPERS.

Cautions

- Do not apply any voltages until a qualified technician has checked the system and the commissioning procedures have been completed.
- ARX and ARE must be connected to 24Vac via a safety transformer conforming to EN 61558.
- Use an isolator with a minimum contact gap of 3mm (conforming to EN 60335-1) to isolate the ARM from the mains supply.
- Ensure wires are not inadvertently crossed over.
- Check torque requirements of damper (or other device) to be driven. Do not exceed rated output torque.
- Interference with those parts under sealed covers renders the guarantee void.
- The design and performance of TAC Satchwell equipment is subject to improvement and therefore liable to alteration without notice.
- Information is given for guidance only and TAC Satchwell does not accept responsibility for the selection or installation of its products unless information has been given by the Company in writing relating to a specific applications.
- A periodic system check of the control system is recommended. Please contact your local sales office for details.

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